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a speech coder selector in the mobile unit which causes the mobile unit to use a secondary speech coder when the signal strength exceeds a set value, wherein the primary speech coder and the secondary speech coder can exchange compatible data.

30. (Twice amended) A wireless communication system comprising;

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means for determining the quality of a signal received; and

means for switching in a mobile unit from a first speech coder to a second speech coder when the signal quality exceeds a predetermined value, wherein the second speech coder is compatible with the first speech coder.

35. (Twice Amended) A wireless communication system comprising;

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means for determining the loading on a processor; and

means for switching in a mobile unit from a first speech coder to a second speech coder when the processor loading is less than a set value, wherein the second speech coder is compatible with the first speech coder.

38. (Amended) The wireless communication system of Claim 35, wherein the

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first speech coder and the second speech coder are members of a family of speech coders which can exchange compatible data.

REMARKS

The foregoing amendments and the following comments are responsive to the objections and rejections set forth by the Examiner in the September 6, 2002 Office Action.

Claims 1-3 and 5-38 are pending in this application. The Examiner rejected Claims 1-3 and 5-38. In particular, the Examiner rejected Claims 1-3, 5, 6, 8-19, 21-33 and 35-38 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,885,003 ("the Ladden patent") in view of U.S. Patent No. 6,130,577 ("the Tamba patent") further in view of U.S. Patent No. 6,002,719 ("the Parvulescu patent"). The Examiner further rejected Claims 7, 20 and 34 under 35 U.S.C. § 103(a) as being unpatentable over the combination of the Ladden patent in view of the Tamba patent in view of the Parvulescu patent and in further view of U.S. Patent No. 5,469,471 ("the Wheatley III patent").

Applicant would like to thank Examiner Opsasnick for the telephone interview extended to Applicant's counsel of record, John R. King, on November 14, 2002. During the interview, the Examiner agreed that the current references do not teach the concept of compatible first and second coders. Accordingly, Applicant has amended Claim 1 to clarify the patentably distinguishing features of the invention. Applicant has also amended Claims 8, 18, 27, 30 and 35 along the lines discussed in the interview. Reconsideration of the pending claims, as amended, is therefore respectfully requested.

REJECTION OF CLAIMS 1, 8, 18, 27, 30 and 35 UNDER 35 U.S.C. § 103(a)

The Examiner rejected Claims 1, 8, 18, 27, 30 and 35 under 35 U.S.C. § 103(a) as being unpatentable over the Ladden patent in view of the Tamba patent and further in view of the Parvulescu patent. In view of the above claim amendments and the following discussion, Applicant respectfully traverses this rejection.

Ladden appears to teach a wireless communication system where the base station determines when a link between the mobile station and a speech recognition system is required. The base station instructs the mobile unit to switch from a first codec specific to human speech to a second codec specific to speech recognition. Ladden appears to disclose a base station in which the speech coding functions performed by the codec specific to human speech are bypassed when the mobile station requires connection to the codec specific to speech recognition. In this case, the codec in the mobile station specific to speech recognition communicates directly with the front-end of the speech recognition system in the base station. Thus, it appears that the codec specific to human speech is not compatible with the codec specific to speech recognition.

Tamba appears to disclose a mobile communication device capable of operating as either personal handyphone system (PHS) or a personal digital cellular system (PDS). Tamba's device switches, based on the output of the received field strength detection circuit, between a codec for performing coding and decoding processing on a speech signal in the PHS mode and a codec for performing coding and decoding on a speech signal in the PDS mode. As the PHS function and the PDS function do not utilize the same transmitting and receiving frequency bands, the PHS and PDS codecs

are not compatible. Also, Tamba appears to disclose utilizing the received field strength to determine when to switch between the PHS and PDS modes. Thus, it appears that Tamba teaches the use of an alternate coder to increase signal quality.

Parvulescu appears to disclose a non-real time two-way messaging system, which utilizes data compression techniques to reduce battery drain. Since the messaging system is not intended for real time conversations, the data compression processor may take a long period of time to optimize the data compression to produce a message of optimum compactness. When transmitted, the compact message requires a minimal amount of transmission time and thus, the amount of battery capacity required to complete the transmission is also minimal. Again, as the messaging system is not intended for real time conversations, Parvulescu appears to disclose operating the data compression processor at a low clock rate to further reduce battery drain.

In contrast, in at least one embodiment of the invention, the mobile unit, not the base station, determines the quality of signals received from the base station. Based on this quality, the mobile unit determines whether the voice data can be adequately transmitted, using a second speech coder, which is less accurate, reduces processor usage, and requires less battery capacity to encode speech than a first speech coder. The voice data is not stored or delayed for significant or noticeable periods of time, as occurs in a non-real time system. In at least one embodiment of the invention, the wireless communication system determines if the signal quality can be reduced, not increased, in order to conserve battery life.

Additionally, in an embodiment, the first and second speech coders are compatible. That is, the coders are members of a family of speech coders and can exchange compatible data. Whether the first speech coder or the second speech coder is used to encode and compress the data, the speech data at the output of the codec may be decoded by a single decoder. In another embodiment, the alternative speech coder is less accurate than the primary speech coder in coding and decoding the voice data. Furthermore, in one embodiment, the primary speech coder is a bit-exact speech coder and the secondary speech coder is not a bit-exact coder and thus uses less battery power.

Neither Ladden, Tamba, nor Parvulescu, alone or in combination, disclose, teach or suggest a mobile unit which determines the quality of the received signals so as to switch between compatible coders when the signal quality is high in order to reduce power consumption in the mobile unit. Furthermore, neither Ladden, Tamba, nor Parvulescu, alone or in combination, disclose, teach or suggest the use of switching to a less accurate coder within a family of compatible coders if the determined signal quality is high.

Applicant asserts that Claims 1, 8, 18, 27, 30 and 35 are not obvious in view of Ladden, Tamba and Parvulescu. Applicant therefore respectfully submits that Claims 1, 8, 18, 27, 30 and 35 are patentably distinguished over the cited references and Applicant respectfully requests allowance of Claims 1, 8, 18, 27, 30 and 35.

REJECTION OF CLAIMS 2, 3, 5, 6, 9-17, 19, 21-26, 28, 29, 31-33 and 36-38 UNDER 35 U.S.C. § 103(a)

The Examiner rejected Claims 2, 3, 5, 6, 9-17, 19, 21-26, 28, 29, 31-33 and 36-38 under 35 U.S.C. § 103(a) as being unpatentable over the Ladden patent in view of the Tamba patent and further in view of the Parvulescu patent. In view of the above claim amendments and the following discussion, Applicant respectfully traverses this rejection.

Claims, 2, 3, 5, and 6, which depend from Claim 1, are believed to be patentable for the same reasons articulated above with respect to Claim 1, and because of the additional features recited therein.

Claims 9-17, which depend from Claim 8, are believed to be patentable for the same reasons articulated above with respect to Claim 8, and because of the additional features recited therein.

Claims 19, and 21-26, which depend from Claim 18, are believed to be patentable for the same reasons articulated above with respect to Claim 18, and because of the additional features recited therein.

Claims 28 and 29, which depend from Claim 27, are believed to be patentable for the same reasons articulated above with respect to Claim 27, and because of the additional features recited therein.

Claims 31-33, which depend from Claim 30, are believed to be patentable for the same reasons articulated above with respect to Claim 30, and because of the additional features recited therein.

Claims 36-38, which depend from Claim 35, are believed to be patentable for the same reasons articulated above with respect to Claim 35, and because of the additional features recited therein.

REJECTION OF CLAIMS 7, 20, 34 UNDER 35 U.S.C. § 103(a)

The Examiner rejected Claims 7, 20, 34 under 35 U.S.C. § 103(a) as being unpatentable over the combination of the Ladden patent in view of the Tamba patent in view of the Parvulescu patent, and further in view of the Wheatley III patent. In view of the above claim amendments and the following discussion, Applicant respectfully traverses this rejection.

Claim 7, which depends from Claim 1, is believed to be patentable for the same reasons articulated above with respect to Claim 1, and because of the additional features recited therein.

Claim 20, which depends from Claim 18, is believed to be patentable for the same reasons articulated above with respect to Claim 18, and because of the additional features recited therein.

Claim 34, which depends from Claim 30, is believed to be patentable for the same reasons articulated above with respect to Claim 30, and because of the additional features recited therein.

CONCLUSION

In view of the forgoing, the present application is believed to be in condition for allowance, and such allowance is respectfully requested. If further issues remain to be resolved, the Examiner is cordially invited to contact the undersigned such that any remaining issues may be promptly resolved. Also, please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 12/4/02

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Version With Markings to Show Changes Made

IN THE CLAIMS:

1. (Three times amended) A wireless communication system comprising:

a base station which transmits signals;

a mobile unit which receives the signals from the base station, the mobile unit containing a first speech coder and a second speech coder, wherein the first speech ~~en~~coder is ~~bit-exact and~~compatible with the second speech ~~en~~coder ~~is not bit-exact~~, the mobile unit encoding voice data in a signal to transmit using either the first speech coder or the second speech coder;

a signal strength detector in the mobile unit which determines the quality of the signals received by the mobile unit; and

a coder selector in the mobile unit which directs the mobile unit to switch from the first speech coder to the second speech coder when the quality of the signals exceeds predetermined levels, wherein the second speech encoder reduces power consumption in the mobile unit.

5. (Twice Amended) The wireless communication system of Claim 1, wherein the first speech coder is bit exact and the second speech coder ~~are compatible~~is non-bit exact.

8. (Three Times Amended) A method of conserving power in a wireless communication system comprising the acts of:

determining the quality of at least one signal received from a base station; and

selecting in a mobile unit a secondary speech coder when the signal quality exceeds a predetermined value, wherein the secondary speech coder is ~~less accurate than~~compatible with a primary speech coder.

12. (Amended) The method of Claim 8, wherein the secondary speech coder is one of a family of speech coders which can exchange compatible data.

18. (Three Times Amended) A wireless communication system comprising;

a processor usage indicator which determines the loading on a processor in a mobile unit; and

a speech coder selector in a mobile unit which causes the mobile unit to use a secondary speech coder when the loading on the processor exceeds a set

value, wherein the secondary speech coder is ~~less accurate than~~compatible with a primary speech coder.

26. (Twice Amended) The wireless communication system of Claim 23, wherein ~~the secondary speech coder is one of a family of speech coders~~encoded data may be decoded by a single decoder.

27. (Three Times Amended) A wireless communication system comprising;

a signal strength indicator which determines the quality of a signal received by a mobile unit; and

a speech coder selector in the mobile unit which causes the mobile unit to use a secondary speech coder when the signal strength exceeds a set value, wherein the primary speech coder and the secondary speech coder ~~is less accurate than a primary speech coder~~can exchange compatible data.

30. (Twice amended) A wireless communication system comprising;

means for determining the quality of a signal received; and

means for switching in a mobile unit from a first speech coder to a second speech coder when the signal quality exceeds a predetermined value, wherein the second speech coder is ~~less accurate than~~compatible with the first speech coder.

35. (Twice Amended) A wireless communication system comprising;

means for determining the loading on a processor; and

means for switching in a mobile unit from a first speech coder to a second speech coder when the processor loading is less than a set value, wherein the second speech coder is ~~less accurate than~~compatible with the first speech coder.

38. (Amended) The wireless communication system of Claim 35, wherein the first speech coder and the second speech coder are members of a family of speech coders which can exchange compatible data.

Exhibit I - Clean Version Of Pending Claims

1. (Three times amended) A wireless communication system comprising:

a base station which transmits signals;

a mobile unit which receives the signals from the base station, the mobile unit containing a first speech coder and a second speech coder, wherein the first speech coder is compatible with the second speech coder, the mobile unit encoding voice data in a signal to transmit using either the first speech coder or the second speech coder;

a signal strength detector in the mobile unit which determines the quality of the signals received by the mobile unit; and

a coder selector in the mobile unit which directs the mobile unit to switch from the first speech coder to the second speech coder when the quality of the signals exceeds predetermined levels, wherein the second speech encoder reduces power consumption in the mobile unit.

2. The wireless communication system of Claim 1, wherein the coder selector switches from said second speech coder to said first speech coder when the quality of the signals is less than the predetermined levels.

3. The wireless communication system of Claim 1, wherein the coder selector may be bypassed.

5. (Twice Amended) The wireless communication system of Claim 1, wherein the first speech coder is bit exact and the second speech coder is non-bit exact.

6. The wireless communication system of Claim 1, wherein the signal strength detector measures the estimated frame-by-frame bit error rate.

7. The wireless communication system of Claim 1, wherein the signal strength detector is based upon absolute power.

8. (Three Times Amended) A method of conserving power in a wireless communication system comprising the acts of:

determining the quality of at least one signal received from a base station; and

selecting in a mobile unit a secondary speech coder when the signal quality exceeds a predetermined value, wherein the secondary speech coder is compatible with a primary speech coder.

9. The method of Claim 8 further comprising the act of selecting a primary speech coder when the signal quality is less than the predetermined value.

10. The method of Claim 8, wherein the act of selecting a secondary speech coder may be selectively activated.

11. The method of Claim 8, wherein the secondary speech coder is not bit-exact.

12. (Amended) The method of Claim 8, wherein the secondary speech coder is one of a family of speech coders which can exchange compatible data.

13. The method of Claim 8, wherein the secondary speech coder saves power.

14. The method of Claim 8, wherein the secondary speech coder reduces processor loading.

15. The method of Claim 8, wherein the quality of signals received is determined by the RX Quality.

16. The method of Claim 8, wherein the quality of signals received is determined by the estimated frame-by-frame bit error rate.

17. The method of Claim 8, wherein the quality of signals received is determined by a parity check.

18. (Three Times Amended) A wireless communication system comprising;

a processor usage indicator which determines the loading on a processor in a mobile unit; and

a speech coder selector in a mobile unit which causes the mobile unit to use a secondary speech coder when the loading on the processor exceeds a set value, wherein the secondary speech coder is compatible with a primary speech coder.

19. The wireless communication system of Claim 18, wherein the speech coder selector may be selectively activated.

20. (Amended) The wireless communication system of Claim 18, wherein the secondary speech coder saves power.

21. (Amended) The wireless communication system of Claim 18, wherein the secondary speech coder reduces processor loading.

22. (Amended) The wireless communication system of Claim 18, wherein the speech coder selector causes the mobile unit to use the primary speech coder when the loading on the processor is less than a set value.

23. The wireless communication system of Claim 22, wherein the primary speech coder and the secondary speech coder are members of a family of speech coders.

24. (Amended) The wireless communication system of Claim 23, wherein the secondary speech coder is not bit-exact.

25. (Amended) The wireless communication system of Claim 23, wherein the primary speech coder is bit-exact.

26. (Twice Amended) The wireless communication system of Claim 23, wherein encoded data may be decoded by a single decoder.

27. (Three Times Amended) A wireless communication system comprising;

a signal strength indicator which determines the quality of a signal received by a mobile unit; and

a speech coder selector in the mobile unit which causes the mobile unit to use a secondary speech coder when the signal strength exceeds a set value, wherein the primary speech coder and the secondary speech coder can exchange compatible data.

28. (Amended) The wireless communication system of Claim 27, wherein the speech coder selector causes the mobile unit to use the primary speech coder when the loading on the processor is less than a set value.

29. The wireless communication system of Claim 27, wherein the speech coder selector may switch between the primary speech coder and the secondary speech coder each frame.

30. (Twice amended) A wireless communication system comprising;

means for determining the quality of a signal received; and

means for switching in a mobile unit from a first speech coder to a second speech coder when the signal quality exceeds a predetermined value, wherein the second speech coder is compatible with the first speech coder.

31. The wireless communication system of Claim 30, wherein the means for switching switches from the second speech coder to the first speech coder when the signal quality is below the predetermined value.

32. The wireless communication system of Claim 30, wherein the second speech coder consumes less power than the first speech coder.

33. The wireless communication system of Claim 30, wherein the switching means is software controlled.

34. The wireless communication system of Claim 30, wherein the predetermined value may be dynamically adjusted.

35. (Twice Amended) A wireless communication system comprising;

means for determining the loading on a processor; and

means for switching in a mobile unit from a first speech coder to a second speech coder when the processor loading is less than a set value, wherein the second speech coder is compatible with the first speech coder.

36. The wireless communication system of Claim 35, wherein the means for switching switches from the second speech coder to the first speech coder when the processor loading is less than a set value.

37. The wireless communication system of Claim 35, wherein the switching means may be selectively disabled.

38. (Amended) The wireless communication system of Claim 35, wherein the first speech coder and the second speech coder are members of a family of speech coders which can exchange compatible data.